

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



REC'D 13 JAN 2004

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Applicant's or agent's file reference 2002-P-106	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/KR02/00716	International filing date (day/month/year) 19 APRIL 2002 (19.04.2002)	Priority date (day/month/year) 04 MARCH 2002 (04.03.2002)
International Patent Classification (IPC) or national classification and IPC IPC7 H01L 21/3065		
Applicant KANG, Hyosang		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of _____ sheets.</p>	
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>	

Date of submission of the demand 16 SEPTEMBER 2003 (16.09.2003)	Date of completion of this report 30 DECEMBER 2003 (30.12.2003)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer Suh, Tae Jun Telephone No. 82-42-481-5732 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR02/00716

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
pages 1-7, as originally filed
pages, filed with the demand
pages, filed with the letter of
- ☒ the claims:
pages 8, as originally filed
pages, as amended (together with any statement) under Article 19
pages, filed with the demand
pages, filed with the letter of
- ☒ the drawings:
pages 1/4 - 4/4, as originally filed
pages, filed with the demand
pages, filed with the letter of
- ☐ the sequence listing part of the description:
pages, as originally filed
pages, filed with the demand
pages, filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheet

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR02/00716

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1</u>	YES
	Claims	<u>NONE</u>	NO
Inventive step (IS)	Claims	<u>1</u>	YES
	Claims	<u>NONE</u>	NO
Industrial applicability (IA)	Claims	<u>1</u>	YES
	Claims	<u>NONE</u>	NO

2. Citations and explanations (Rule 70.7)

1. Reference is made to the following documents:

D1: JP 01175738 (SHARP CO.)

D2: US 6261406B1 (LSI LOGIC CO.)

2. Novelty (N)

Claim 1 relates to a dry etching method for a semiconductor wafer by generating plasma which comprises the steps of generating plasma after bringing the lower surface of the edge of the wafer in contact with the first electrode and etching the upper surface and the side surface of the edge of the semiconductor by reactive etching using ionized species and generating plasma after bringing the upper surface of the edge of the wafer in contact with the second electrode and etching the lower surface and the side surface of the edge of the semiconductor by plasma etching using radicals.

D1 discloses a dry etching method of a wafer using an apparatus which has a lower electrode 1 which has an exposed plane region with a dimension smaller than the projected dimension of the object 2 onto the plane and on which the object 2 is placed while it is brought into contact with the object 2, a protective plate 3 which is provided on the lower electrode 1 so as to cover the part of the lower electrode 1 other than the plane region. D2 discloses a dry etching method within a substrate etching chamber having a lower surface of the device generally arranged over a substrate outer top surface such that a gap spacing between is equidistant.

Except that Claim 1 in the present invention, D1 and D2 all utilize a dry etching method for a wafer which is partially or wholly exposed to plasma gas in order to achieve the object of each invention, it is apparent that the specific purpose and subject matter of the present invention in claim 1 differs significantly from those in references D1 and D2.

Therefore, the subject matter of claim 1 is novel under Article 33(1) and (2).

3. Industrial Applicability (IA)

Claim 1 is considered to be industrially applicable.

4. Inventive Steps (IS)

Claim 1 of the present invention describes a dry etching method for a semiconductor wafer such that the materials deposited on the upper, the side and the lower surfaces of the edge of the wafer are removed using plasma.

Although the inventions disclosed in references D1 and D2 use dry etching methods for a wafer, the references do not disclose a selective etching method wherein various parts of a wafer including the upper, side and lower parts are etched by moving an electrostatic chuck up and down in order to bring the lower and upper surfaces of the edge of the wafer in contact with the first and second electrodes. Therefore, it is apparent that the invention in claim 1 involves an inventive step under Article 33(3) since the subject matter as a whole is neither obvious to the person having ordinary skill in the art nor can it be easily conceived from the technical features disclosed in reference D1 and D2.